Review: *Introduction to the Technology of Explosives*

Paul W. Cooper and Stanley R. Kurowski
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This book is intended as an introduction to some of the technologies associated with explosives, propellants, and pyrotechnics.

In contrast to some earlier similar books, the authors saw fit to include enough mathematics to allow the reader to accomplish some useful tasks after having read the book. However, the amount, and level, of the mathematics used should not present any problems to even a reasonably non-technical reader. Similar to other works, the emphasis is on military and government applications. The chapters are summarized below:

Chemistry of Explosives

In this first, and very important, chapter the authors introduce some of the important chemical concepts required to understand the reactions that explosives, propellants, and pyrotechnics undergo. Included are the concepts of oxygen balance, stoichiometry, and some typical formulations.

Mechanics of Burning

The simple mechanics of burning, including some geometrical considerations, and gas states are presented.

Sound, Shock, and Detonation

The physical properties of materials are presented, followed by sound and shock waves, finishing with a description of some output tests.

Initiation and Initiators

Various mechanisms of initiation and descriptions of various technical and safety tests that may be used to quantify sensitivity to initiation are presented. A comprehensive description of various initiators is shown along with some analysis of their methods of function.

Scaling in Design and Analysis

This chapter is a treatment of the effects of scaling in explosive design and effects, including a brief analysis of the effects of explosives in air, water, and earth, and of jet formation and penetration.

Off-the Shelf Explosive Devices

Herein is a brief "catalog" of some available explosive items from various manufacturers.

Classification, Transportation, and Storage of Explosives

Some regulatory items concerning how explosives are to be classified, transported and stored are briefly covered.

Explosive Facilities and Explosive Operations

Considerations concerning facility structures, manufacturing operations, testing, safety and some regulatory matters are examined.

Each chapter ends with a "Related Reading" section which will assist the reader in obtaining further information.

A book such as this, especially one that gives more than a superficial look at a number of topics, should have had better editing. Some of the errors are merely typographic. However, a typographic error calls into question any value which might be given in, say, a table. Some typographic errors are more serious, such as the one just below 2.1 on page 42 where an explanation of the dimensions of the burning rate coefficient are given as (in./s/ psi^n), where, I suspect, what was intended was (in./s– psi^n).

Other errors such as listing IMR propellant as a double base composition on page 43, are errors of fact and may call into question other factual data.

In some cases the inconsistency may cause problems for a reader who is unfamiliar with the subject. As an example, toward the bottom of page 10, two examples of negative oxygen balance given are given. One is listed as (85.57%) and the other as (–35.9%). Is one to use the "–" sign, or not?

The explanation of the National Electric Code for hazardous location wiring, on page 180, may give an inexperienced user the completely wrong idea as to how to proceed with the design of a safe electrical system.

While the book is a welcome addition to the literature, this reviewer finds it difficult to whole-heartedly recommend the book in its present state. If some details were to be "cleaned" up in a second edition it would become a very useful addition to a technical library.